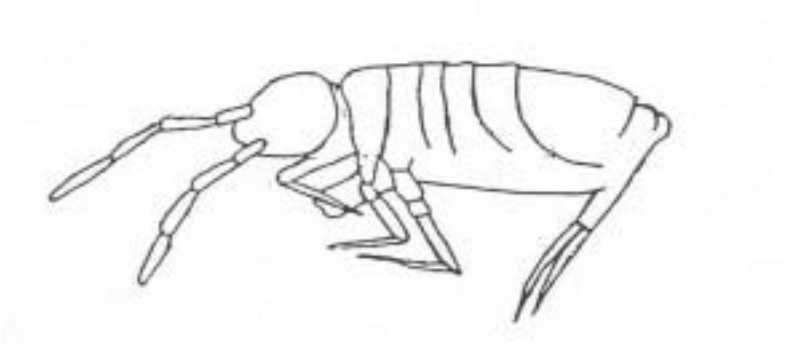
Conservation Assessment for Indiana Cave Springtail (Sinella Alata)



(Christiansen & Bellinger, 1998)

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This Conservation Assessment was prepared to compile the published and unpublished information on Sinella alata. It does not represent a management decision by the U.S. Forest Service. Though the best scientific information available was used and subject experts were consulted in preparation of this document, it is expected that new information will arise. In the spirit of continuous learning and adaptive management, if you have information that will assist in conserving the subject community and associated taxa, please contact the Eastern Region of the Forest Service Threatened and Endangered Species Program at 310 Wisconsin Avenue, Milwaukee, Wisconsin 53203.

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EXECUTIVE SUMMARY

The Indiana cave springtail is designated as a Regional Forester Sensitive Species on the Hoosier National Forest in the Eastern Region of the Forest Service. The purpose of this document is to provide the background information necessary to prepare a Conservation Strategy, which will include management actions to conserve the species.

Sinella alata is a springtail insect that is known only from caves. It is endemic to Indiana, where it has been found in both the southcentral and southeastern karst belts.

NOMENCLATURE AND TAXONOMY

Classification: Class Insecta
Order Collembola
Family Entomobryidae

Scientific name: Sinella alata

Common name: Indiana cave springtail

Synonyms: none

This species was described by Christiansen (1960) as Sinella alata and has remained taxonomically stable since that time.

DESCRIPTION OF SPECIES

Sinella alata, typical of other springtails, is a tiny insect, reaching a length of about 2.2 millimeters. The species is eyeless and unpigmented, typically dull yellow or white in appearance. Identification of this species requires a specialist knowledgeable in the taxonomy of springtails.

LIFE HISTORY

Nothing is known specifically about the life history of Sinella alata. In general springtails lay their eggs on the substrate in a concealed location. Several molts occur prior to the insect reaching its adult size, but in springtails no metamorphosis occurs and the juveniles and adults are similar except in size (Borror and DeLong, 1971).

HABITAT

This species is a troglobite, thus occurs only in caves. It is usually found in moist organic litter, stream detritus stranded on mudbanks, on raccoon or woodrat droppings, or similar nutrient rich microhabitats.

DISTRIBUTION AND ABUNDANCE

Sinella alata is endemic to Indiana, where it is found in both karst belts. In the south-central karst (Mitchell Plain and Crawford Upland), Christiansen (1960) described the species from one cave in each of Lawrence and Monroe counties. It was subsequently found in Orange (Lewis, 1994), Crawford, Harrison and Washington counties (Lewis, 1998). In the southeastern Indiana karst it has been reported from Clark (Lewis, 1983), Jennings (Lewis, 1995), Jefferson and Ripley counties (Lewis & Rafail., 2002).

RANGEWIDE STATUS

Global Rank: G3 vulnerable; The global rank of G3 is assigned to species that are known from between 21-100 localities. Sinella alata has been reported from approximately 30 localities.

Indiana State Rank: S3 vulnerable; The state rank of S3 is similarly assigned to species that are known from between 21-100 localities. All of the known caves in which Sinella alata is found are in Indiana.

POPULATION BIOLOGY AND VIABILITY

Nothing is known specifically about Sinella alata. In general springtails feed on decaying plant material, fungi, bacteria or arthropod feces (Borror and Delong, 1971).

POTENTIAL THREATS

Sinella alata is a tiny litter dwelling insect that is widespread in caves of the Hoosier National Forest and appears to be little threatened by human visitation to caves. Most of the caves from which it is known are rarely visited nor or they particularly threatened at present.

SUMMARY OF LAND OWNERSHIP AND EXISTING HABITAT PROTECTION

On the Hoosier National Forest Sinella alata is known from caves in several areas: (1) Little Blue River drainage in Salt Shake Cave and Papoose Cave (Hemlock Cliffs Special Area); (2) Little Africa area in Beaver Attack Cave; (3) Blue River drainage in Duggins Spring Cave; (4) Springs Valley area in Campground Cave; and (5) Deam Wilderness in Frog Pond Ridge Pot. Papoose Cave and Frog Pond Ridge Pot receive the restrictive management accorded forest service special areas or wilderness areas (USDA Forest Service, 1991; 2000).

Sinella alata is also known from several caves on the IDNR Harrison Crawford State Forest; Suicide Cave, Washington Co., which is gated and managed by the Indiana Karst Conservancy (Lewis, 1998); and several caves on the Big Oaks National Wildlife Refuge (Lewis & Rafail, 2002).

SUMMARY OF MANAGEMENT AND CONSERVATION ACTIVITIES

No species specific management or conservation activities are being conducted concerning Sinella alata, however cave and karst habitat located on the Hoosier National Forest are subject to standards and guidelines for caves and karst protection and management as outlined in the Hoosier National Forest Land and Resource Management Plan (Forest Plan) (USDA Forest Service, 1991). These standards and guidelines include the following:

> *Caves are protected and managed in accordance with the Federal Cave and Karst Resources Protection Act of 1988, Forest Service Manual 2353, Memorandums of Understanding between the forest service and the National Speleological Society, the Indiana Karst Conservancy, Inc., the Forest Cave Management Implementation Plan, and individual specific cave management plans.
>
> *Except where modified by an existing cave management prescription, vegetation within a 150-200 foot radius of cave entrances and infeeder drainages with slopes greater than 30 percent will generally not be cut. No surface disturbing activities will be conducted on any slopes steeper than 30 percent adjacent to cave entrances. Similar protection areas will be maintained around direct drainage inputs such as sinkholes and swallow holes known to open into a cave's drainage system of any streams flowing into a known cave.
>
> *Allow no sediment from erosion of access roads and drilling sites to wash into caves or karst features.
>
> *Seismic surveys requiring explosives shall not be conducted directly over known cave passages or conduits.
>
> *All caves will be managed as significant.
>
> (USDA Forest Service, 1991)

The forest plan includes a cave and karst management implementation plan. This management plan places an emphasis on cave resource protection and mitigation. Understanding of the caves is established through mapping, bioinventory, cataloging of resources (e.g., archaeological, paleontological, speleothems, etc.), and estimating use levels and trends. Protection zones or other mitigation measures recommended by a management prescription will be established around caves entrances, sinkholes and swallowholes. Specific criteria will include consideration for protection of entrance and

cave passage microclimate, animals inhabiting the cave, physical and chemical parameters and aesthetic values associated with the cave.

RESEARCH AND MONITORING

A cave bioinventory of the Hoosier National Forest has resulted in the discovery of several additional populations of Sinella alata (Lewis, et al., 2002; and in progress).

RECOMMENDATIONS

Retain on list of Regional Forester Sensitive Species.

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